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Record of Decision
Summary of Remedial Alternative Selection
Summit National Site

SITE: Summit National - Deerfield, Ohio

STATEMENT OF BASIS AND PURPOSE

The selection of the remedy is based on the Administrative Record for the Summit National site. Attachment 1 contains the Responsiveness Summary, and Attachment 2 contains the index to the administrative record. The decision document represents the selected remedial alternative for the Summit National site. It was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan to the extent practicable.

The remedial action will require future operation and maintenance activities to assure the continued effectiveness of the remedy. These activities will be considered eligible for Trust Fund monies for a period not to exceed 1 year. With respect to restoration of ground or surface water quality, the operation and maintenance costs will be eligible for Trust Fund monies for a period of up to 10 years. I have also determined that the action being taken is appropriate, when balanced against the availability of trust monies for use at other sites. This Record of Decision addresses all operable units for remedial action at the Summit National site in Deerfield, Ohio.

DESCRIPTION OF THE SELECTED REMEDY

U.S. EPA's preferred alternative includes limiting access and future uses of the site; monitoring surface water and groundwater; removal of on-site structures, and placing debris in an off-site permitted landfill or under the multi-layer cap; excavating and onsite incinerating "hot spot" soils, sediments, buried drums and tanks including their contents; placement of all incinerated material in an on-site RCRA landfill; installation of a multi-layer cap over the entire site; a vertical barrier (slurry wall) around the perimeter of the site; the installation of wells over the site to extract and treat groundwater on-site; eliminating on-site surface water and treating it along with the groundwater treatment system; rerouting of the southern and eastern ditches to an area off-site; regrading and revegetating the site surface; and relocating the Watson residence to another area not affected by the site.

During the public comment period on U.S. EPA's Proposed Plan for the site, the Summit National Steering Committee (SNSC), representing 85 potentially responsible parties, made written proposals for a privately financed remedy at the site and have stated their intention to supply additional technical information supporting their proposals. U.S. EPA has addressed the SNSC comments in the attached Responsiveness Summary. It is possible that an agreement with the SNSC could be reached on a different, but comparable, remedy. In such case, additional public comments would be solicited, prior to finalizing a settlement with the potentially responsible parties, or amending this Record of Decision.

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan to the extent practicable, I have determined that the selected alternative for remediation of the Summit National site, is protective of human health and the environment; meets applicable or relevant and appropriate requirements; and is cost-effective.

The Ohio Environmental Protection Agency has been consulted throughout the Remedial Investigation, Feasibility Study, and Record of Decision process. This Record of Decision addresses all concerns at the site, and is the proposed final remedial action for the Summit National site.

This remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, and volume as a principal element, and utilizes permanent solutions and alternate treatment technologies to the maximum extent practicable. To ensure the long-term effectiveness and protectiveness of the selected remedy, a review will be conducted within 5 years after commencement of the remedial action.

June 30th, 1988
Date

Valdas V. Adamkus
Regional Administrator
U.S. Environmental Protection Agency
Region V

Summary of Remedial Alternative Selection
Summit National Site

SITE LOCATION AND DESCRIPTION

The Summit National Site is located in Deerfield Township, Portage County, Ohio, approximately 45 miles southeast of Cleveland and 20 miles west of Youngstown (Figure 1).

The Summit National Site is approximately rectangular in shape and occupies approximately 11.5 acres. It is located at the southeast corner of the intersection of Ohio Route 225 to the west and U.S. Route 224 to the north (Figure 2).

The site was a coal strip mine and contained a coal wash pond and coal stock pile prior to its use as an incinerator site. The coal tipple remains as a 15 ft. high embankment in the northwest corner of the site with a loading dock and concrete debris remaining from the original coal processing facilities. Other prominent features on site are two ponds located in the midsection of the site, an abandoned incinerator and two buildings in the southeast corner, a scale house in the northwest corner, and two dilapidated buildings in the northeast corner. Additionally, it is estimated that approximately 900-1,600 drums and three known tanks and one suspected tank remain buried on site. Little vegetation is growing on site since most of the site was graded following periodic surface cleanup activities which were performed from 1980 through 1982. The site is enclosed by a 6 ft. high fence with two locked gates for entrance from Route 225.

The area immediately surrounding the site has been developed for a variety of uses, primarily rural residences, light industries and agriculture. Several residences are located to the north, east and west within 500 ft. of the site. A roller skating rink is immediately north of the site. Light industries in the area include a fuel distributor, a cement plant and manufacturer of septic tanks, two sanitary landfills, and used tire storage lots. Unused area near the site are either wooded or unvegetated strip mined lands.

SITE HISTORY AND ENFORCEMENT ACTIVITY

All information pertaining to site history was obtained from and based on the existing Summit National Remedial Action Master Plan (RAMP) (CH_2M Hill, August 1983) and the Ohio EPA files available from the Twinsburg, Ohio office.

In June 1973, Summit National Liquid Services obtained a "Permit to Install" an 18,000 gallon per month liquid waste incinerator from the Ohio EPA. In April 1974 an operating permit for the incinerator was issued by the Ohio EPA. The facility, called Summit National Liquid Services, received liquid wastes from various manufacturing and chemical companies. The wastes were either delivered in bulk using tanker trucks or in 55 gallon drums on flatbed trucks.

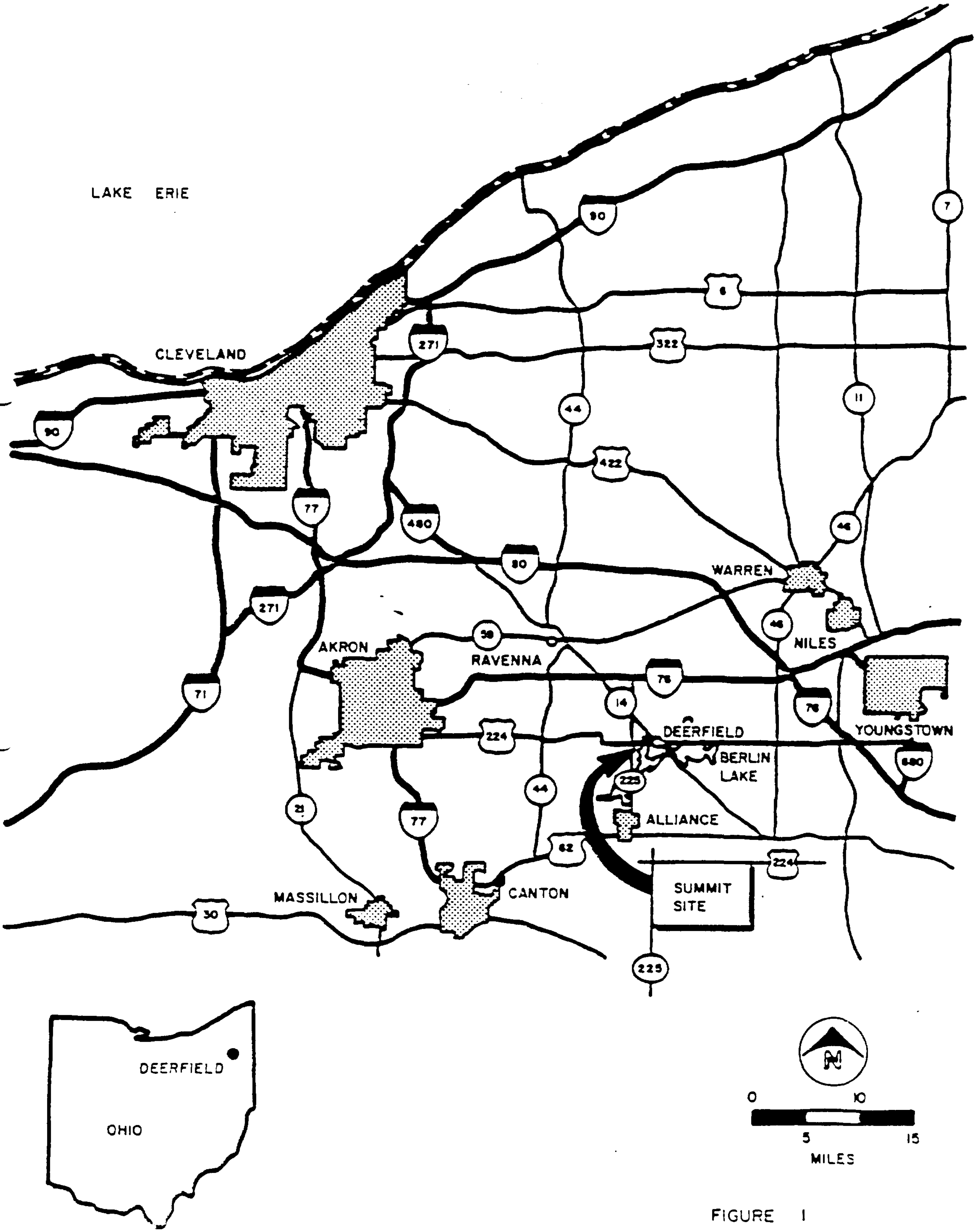

FIGURE 1
SUMMIT SITE LOCATION
SUMMIT NATIONAL FS

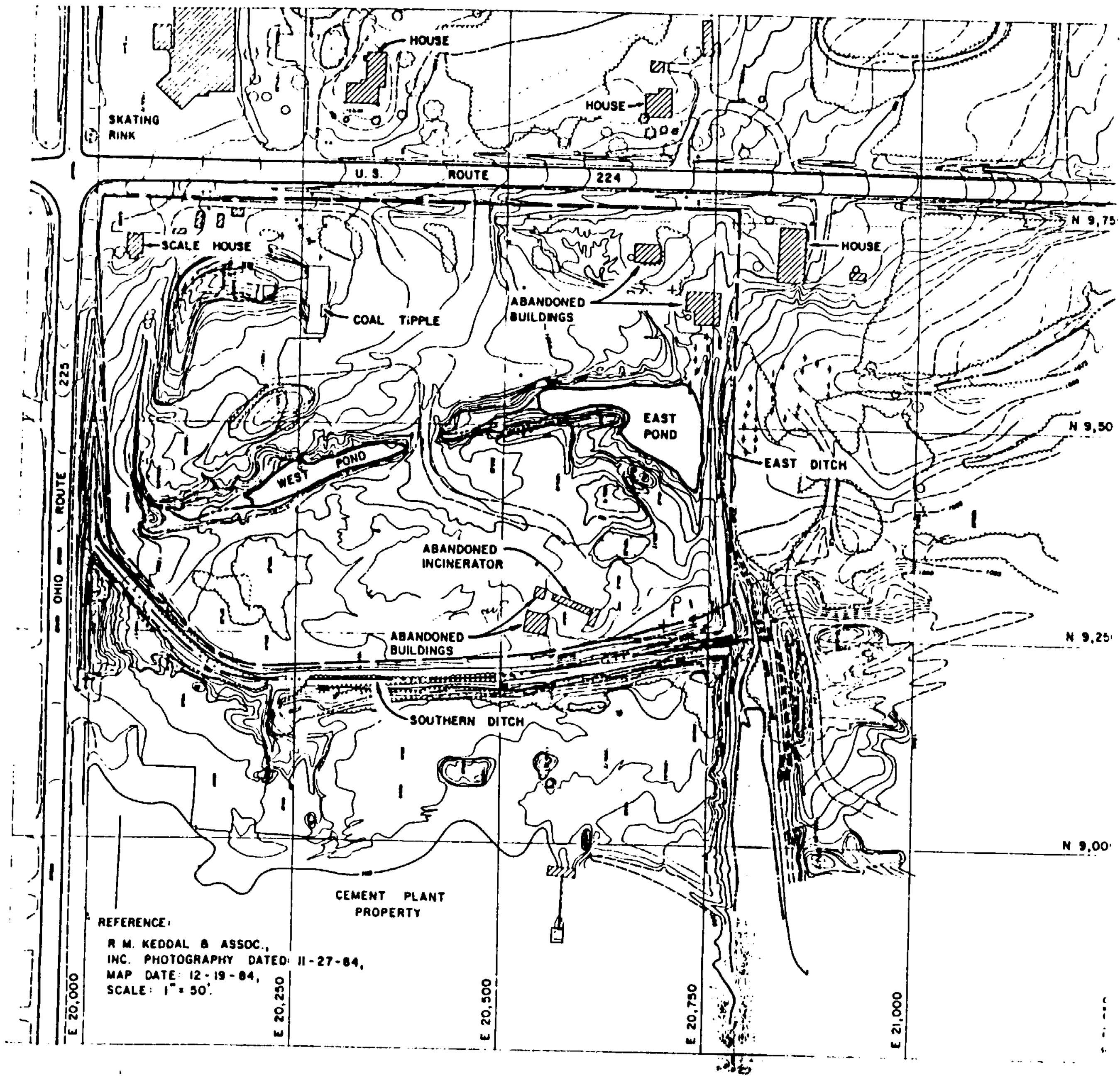

FIGURE 2
SITE MAP

Once brought to the facility, wastes were stored unprotected in 55 gallon drums, an open pit referred to as the polymer pit, or bulk tanks of varying size. Many wastes were mixed with flammable liquids and incinerated. Some wastes were buried on site, while others were dumped or leaked onto the site soil. The incinerator reportedly operated until 1978.

During its operating history, a variety of industrial wastes were disposed at the Summit National site. Drummed and tanked wastes disposed included waste oils, resins, paint sludges, flammable solvents, chlorinated solvents, plating sludges, pesticide wastes, phenols, cyanides, acids, various polymers, and lab packs. Many of the drums and bulk tanks stored on the surface leaked quantities of these materials into the surface of the site. It was reported that the concrete block pit was used for liquid waste mixing and solidification and overflowed on a recurring basis during periods of heavy rainfall.

In June 1975 the Northeast District Office of the Ohio EPA investigated a complaint of an unauthorized discharge of waste water from the site. The U.S. EPA conducted an investigation of the site on October 29, 1976 and found evidence of numerous leaks and spills. The owner was notified of the need for a Spill Prevention Control and Countermeasures Plan (SPCC) and informed that he was in violation of state laws relating to treatment and disposal of industrial waste. The Ohio EPA Director issued Final Findings and Orders on June 12, 1978. These required Summit National to cease receiving waste materials, remove all liquid waste from the site, and receive written approval prior to removing any material from the facility. No further waste material was received after this date. On March 15, 1979, the owner Mr. Georgeoff sold the site without removing any wastes.

In August 1979, the State of Ohio filed a complaint against the present and former owners alleging the operation of a solid waste disposal site without a permit, creation of a public nuisance, failure to comply with orders from the Ohio EPA, and installation of facilities for the storage and disposal of liquid waste without submitting plans to the Ohio EPA. Testing of onsite waste materials established the presence of over 7,500 gallons of a toxic chemical, hexachlorocyclopentadiene, commonly called HCCPD or C-56. In September 1979, U.S. EPA notified the owner that, because C-56 and other hazardous chemicals were leaking to the environment, remedial action was being planned pursuant to Section 311 of the Clean Water Act. The owner refused to take voluntary action or fund the cleanup operation, so U.S. EPA funded the cleanup of C-56 wastes that took place between September and November 1980. The remedial action consisted in disposing of three bulk tanks and their contents (approximately 7,500 gallons), some contaminated soil, and the treatment of contaminated water.

In November 1980, an agreement was reached between the State and eight generators that provided $2.5 million for surface cleanup. Surface cleanup operations, including removal of drums, tanks and various surface debris and a small amount of contaminated soil, were concluded in June 1982. The 1981-82 surface cleanup project removed much of the source of site contamination, but did not include subsurface exploration or cleanup.

In October 1981, the Attorney General of the State of Ohio (OAG) filed an action against the Potentially Responsible Parties (PRPs) under federal law using Section 107 of CERCLA. This suit is to recover past and future costs of removal and remedial actions at and about the site and to recover costs for damages to the natural resources of air, surface waters, groundwater and soils in and around the site. The status of this suit is on hold until the U.S. EPA finalizes the RI/FS document. However, the Judge in this case did have the first reported ruling that it was Congress's intent that CERCLA 107 liabilities are not only for future liabilities, but also past liabilities.

In June and July of 1982, the U.S. EPA and the PRPs negotiated the terms under which an Administrative Order by Consent could be signed allowing the PRPs to conduct and complete an RI/FS at the site. These negotiations were terminated due to the PRPs not accepting U.S. EPA's basic conditions.

In September, 1983, the Summit National Site was placed on the National Priorities List (NPL) which made it eligible for clean-up under the Superfund program. U.S. EPA issued a work assignment to conduct a Remedial Investigation (RI) and Feasibility Study (FS) for the Summit National site. The remedial investigation was conducted in two phases in Fall 1984 and Winter 1986.

In March 1987, the U.S. EPA issued a Section 106 (a) CERCLA Unilateral Administrative Order (AO) to the PRPs at the site. This AO was issued to contain and terminate the actual or threatened release into the environment of hazardous substances due to the deteriorating site conditions. It was observed in December, 1986 by U.S. EPA that the eastern pond on the site was flooding, the embankment about the pond was eroding and an underground tank was leaking. In March 1987, the site went critical due to the Spring rains and thaw. The PRPs informally agreed to reimburse U.S. EPA for response costs related to this emergency action rather than implement the AO. Currently, the U.S. EPA and the PRPs are finalizing a Section 122(h) CERCLA, as amended, Administrative Order by Consent that will reimburse U.S. EPA for the cost of completing the removal actions specified in the AO.

In November 1987, the U.S. EPA, State of Ohio, DOJ, OAG and PRPs started the legal Remedial Design/Remedial Action-Consent Decree negotiations at this site. These negotiations have made progress and are currently on-going between all parties. After the Record of Decision is finalized technical components of the Consent Decree negotiations will commence under the Section 122(c) CERCLA, as amended, Special Notice Letter provisions.

COMMUNITY RELATIONS

Community involvement at the Summit National Site has been moderate. Residents and press have maintained an interest in U.S. EPA activities at the site.

An administrative record has been established for the Summit National site.

This record contains information regarding the Remedial Investigation, Feasibility Study, emergency activities and other historical and administrative information pertinent to the site. The record is located at the U.S. Post Office, 1365 Route 14, in Deerfield, Ohio. The U.S.EPA issued a press release announcing the availability of the proposed plan, Feasibility Study, and other site-related documents; location of the repository; the public comment period, February 12 to March 21, 1988; and the public meeting at the American Legion Hall in Deerfield, Ohio, on February 29, 1988. The index to the Administrative Record is in Attachment 2.

The public meeting was attended by about 150 interested parties, news media, and public officials. During the meeting the U.S. EPA presented the Feasibility Study. The presentation described the different alternatives considered for the site and the preferred alternative. Questions were answered and public comments were invited and accepted. The response to written comments received during the comment period are presented in the Responsiveness Summary, Attachment 1.

SCOPE OF RESPONSE ACTION

This record of decision addresses all affected media at the Summit National site. The scope of response action includes contaminated groundwater, surface and subsurface soils, surface water, sediments, buried drums and tanks. This record of decision is the only operable unit and is the final remedy for the Summit National site.

SITE CHARACTERISTICS

Results of U.S. EPA's Remedial Investigation at the site indicate that surface and subsurface soils, sediments, surface water, and groundwater beneath the site are contaminated with a number of organic and inorganic compounds. Samples taken off-site (south and eastern perimeter) have also been affected by site contamination. The following section presents the major findings and conclusions of the media sampled based on the result from the data obtained. A summary of the most representative organic and inorganic parameters for each media is presented in Attachment 3.

GROUNDWATER

The hydrogeology of the Summit National site is complex. For purposes of discussion and analysis, the strata at the site has been separated into three hydrogeologic units; the water table aquifer, the "intermediate" units, and the Upper Sharon "aquifer," as shown on Figure 3.

Groundwater in the water-table aquifer flows southward and eastward and does not vary much on a seasonal basis. The water-table aquifer is generally 5 to 12 feet below grade. The intermediate unit is separated into two stratas by an unamed limestone. The upper portion flows southeastward and the lower portion flows westward. Groundwater in the Upper Sharon flows northward.

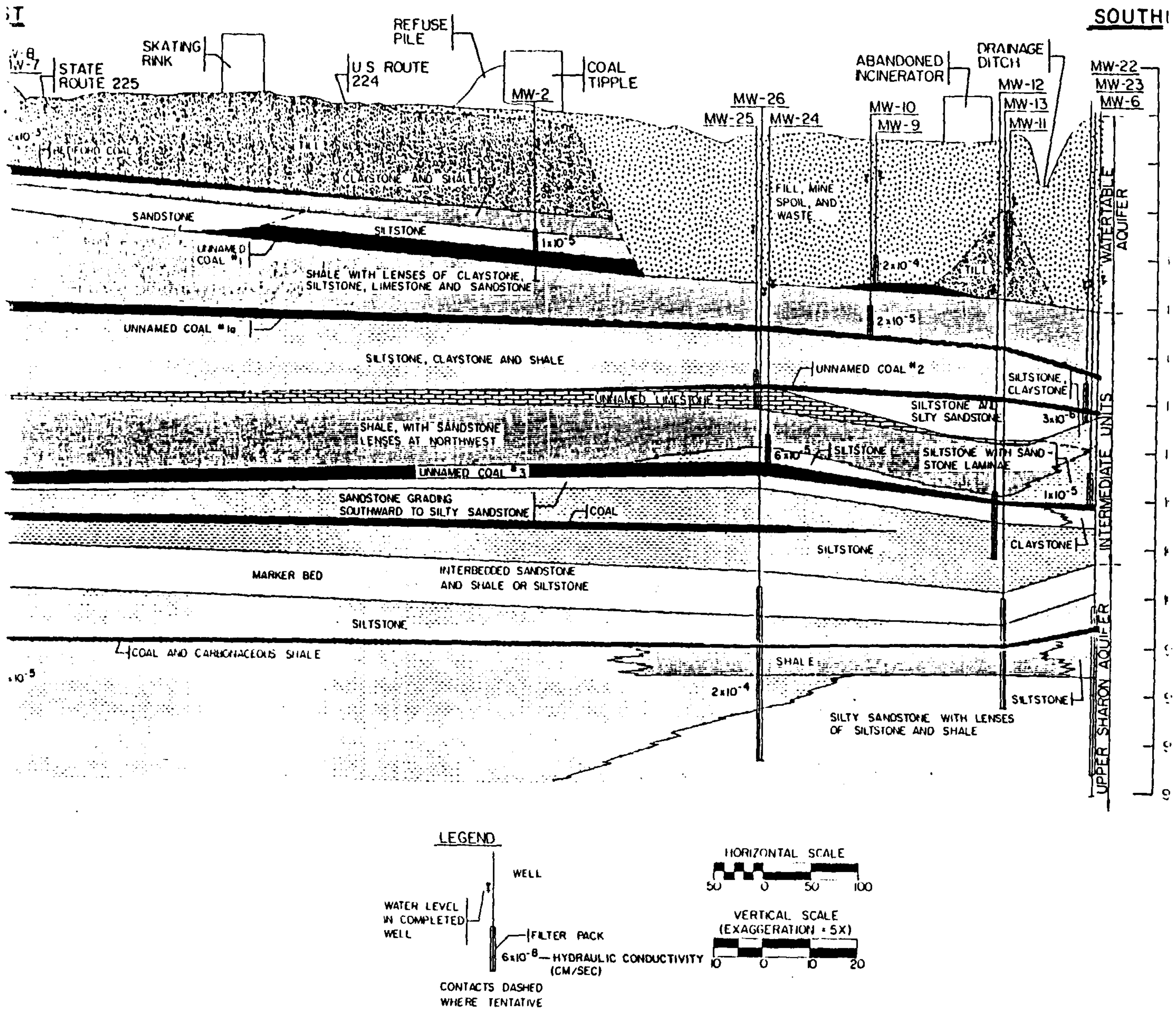

FIGURE 3
GENERAL GEOLOGIC SECTION

Vertical gradients within bedrock vary across the study area. The gradient between the water-table aquifer and all deeper strata is downward at all locations. In bedrock, vertical components are upward at the southern portion of the site and downward in the central portion.

Shallow onsite groundwater in the water-table aquifer and uppermost intermediate units is contaminated with a number of organic compounds, including 2-butanone, phenol, toluene, and bis (2-ethyl hexyl) phthalate. The highest concentration of these contaminants occur in the southwestern quarter of the site and generally decrease across the southern half of the site, from west to east.

Of the deeper intermediate wells, levels of contaminants were detected in only one well, MW-24. Wells in the Upper Sharon aquifer do not present contamination problems. None of the residential wells, which represent water in the intermediate unit and Upper Sharon aquifer, indicated levels of organic contaminants above background. Background is defined as those parameters that occur within the natural range for the area in soils, groundwater, sediments, surface water, and air. Each media is compared to background levels present in the same media.

SOILS

The background soils representing local residential, farm and strip mine soil had detectable levels of numerous organic and inorganic compounds. The origins of these contaminants were not able to be determined from the data obtained during the RI. However, some inorganic compounds such as aluminum, arsenic, iron, maganese, and nickel are associated with coal and coal refuse, and therefore are naturally occurring in a coal mining area.

The onsite surface and subsurface soils (down to 8 ft.) were found to have levels of numerous organic and inorganic contaminants. Many of these contaminants were not observed off site, such as benzene, toluene, and phenol and some were found at levels up to several orders of magnitude above background. Soil levels were compared to an average background which included residential, farming and mining, and were also compared to residential alone. Both comparisons indicate the site is contaminated and has affected offsite soils. Offsite soils south of the site at the cement plant also contained numerous polynuclear aromatic hydrocarbons (PAH's) and other organics at levels above background. The eastern offsite soils also showed contamination, particularly PCBs, at levels that exceeded background concentrations.

SURFACE WATER

Surface water flow at and near the site was observed to occur only in response to seasonal precipitation events. Therefore, no reliable flow estimates or stream loading characteristics could be made. The onsite surface water was found to be contaminated with organic and inorganic compounds at concentrations above background. The east pond had consistently higher levels of contaminants than the west pond, based on total fraction concentration.

Offsite surface water is also contaminated with organics and metals at concentrations above background. The major areas of contamination are the south ditch (downstream) and the lower east drainage ditch (Figure 2).

SEDIMENT

Onsite sediments were found to be contaminated in all fractions analyzed based on concentrations that exceeded background soil concentrations and upstream sediment concentrations (not affected by the site). The west pond samples detected higher concentrations of contaminants in the organic fractions, while the east pond samples showed higher levels of inorganics. The offsite sediment in the southern ditch (upstream and downstream) and lower east drainage ditch were found to have organics that exceeded background. The first and second impoundments located off site to the southeast also showed minor contamination.

AIR QUALITY

The results of the RI indicated that the site emits low levels of VOCs to the air. However, the levels were far below Federal health and safety standards. U.S. EPA concluded that air contamination should not occur unless there is a surface disturbance at the site.

BURIED MATERIAL

Result of the buried materials investigation at the site indicate that five buried tanks and an estimated 900 to 1,600 drums are buried on site. Estimates indicate that the total number of drums existing intact that may contain waste can be 675 to 1,200. Out of five tanks, U.S. EPA removed one tank in Spring 1987. The tank contained several organic and inorganic compounds.

SUMMARY OF RISKS

As part of the RI process, a risk assessment was conducted to determine the potential risk the site may have on human health. The study concluded that unacceptable health risks (greater than 10^{-6} excess life time cancer risk) may occur under a number of exposures. The potential pathways of exposure are incidental ingestion and direct contact of soil, and consumption of contaminated groundwater in the shallow and intermediate water bearing units beneath the site.

Under current conditions exposure of on-site trespassers, offsite workers, and residents, to soils have an average risk which range between $1x10^{-8}$ to $3x10^{-6}$. For the same exposure scenarios but under a plausible maximum case, the risks range between $2x10^{-4}$ to $4x10^{-5}$. The maximum exposure scenario represents a potential for moderate exposure. The noncarcinogenic index is less than 1 for both scenarios and therefore, noncarcinogenic health effects are not likely to occur.

Exposure to sediments under current condition included offsite ditches and the second impoundment. The risk range for the average case is $2x10^{-7}$ to $6x10^{-2}$ and for the maximum case is $6x10^{-6}$ to $1x10^{-7}$. Carcinogenic health affects are not likely to occur under these scenarios with the exception of exposure to ditches under the maximum case. Noncarcinogenic health effects are not likely to occur since the hazard index is less than one.

Under future conditions, onsite workers and residents have a range of $1x10^{-5}$ to $2x10^{-7}$ under an average exposure scenario, and $5x10^{-3}$ to $2x10^{-4}$ under the maximum exposure scenario. The noncarcinogenic hazard index exceeds one under the onsite residents plausible maximum exposure scenario. These results represent a significant potential for carcinogenic and noncarcinogenic health effects.

Exposure to groundwater for onsite residents and workers for future conditions range between $1x10^{-3}$ to $4x10^{-9}$ under the average case, and $3x10^{-1}$ to $1x10^{-3}$ under the maximum exposure case. The noncarcinogenic hazard index for the water table exceeds one for both the average and maximum cases. The highest risks are associated with the water table aquifer, which represent a significant potential for both carcinogenic and noncarcinogenic health effects.

A summary of potential risks associated with the Summit National site is presented in Table 1.

DESCRIPTION OF ALTERNATIVES

The following assembled remedial alternatives represent a range of remediation applicable to the Summit National site. A cost summary is presented in Table 2. The detailed cost analysis for each alternative is presented in Attachment 4.

ALTERNATIVE 1 - NO ACTION

The Superfund program must evaluate the no action alternative to establish a baseline for comparison. However, at the Summit National site this alternative is not protective of human health and the environment as demonstrated by the conclusion of the Public Health Evaluation. Therefore, the no action alternative is not effective and eliminated from further consideration for this site.

ALTERNATIVE 2 - RESIDENT RELOCATION WITH MONITORING

This alternative includes access and deed restrictions, relocation of the Watson residence located on the eastern perimeter, runoff and groundwater monitoring. This alternative can be implemented within one year at a present worth cost of $820,000.

TABLE 1

SUMMARY OF POTENTIAL RISKS ASSOCIATED WITH THE SUMMIT NATIONAL SITE

	Total Cancer Risks		Noncarcinogenic Hazard Index	
Exposure Scenario	Average	Plausible Maximum	Average	Plausible Maximum
<u>Current Conditions - Soil</u>				
On-site trespassers	1×10^{-8}	3×10^{-5}	<1	<1
Off-site workers (southern perimeter)	6×10^{-7}	4×10^{-5}	<1	<1
Off-site residents (eastern perimeter)	3×10^{-6}	2×10^{-4}	<1	<1
<u>Current Conditions - Sediment</u>				
Children in ditches	2×10^{-7}	6×10^{-6}	<1	>1
Teenagers in second impoundment	6×10^{-12}	1×10^{-7}	<1	<1
<u>Future Conditions</u>				
On-site workers				
Soil	2×10^{-7}	2×10^{-4}	<1	<1
Groundwater				
Water Table	5×10^{-5}	3×10^{-2}	>1	>1
Intermediate Unit	2×10^{-5}	1×10^{-3}	<1	>1
Upper Sharon Aquifer	4×10^{-9}	NA	<1	NA
On-site residents				
Soil	1×10^{-5}	5×10^{-3}	<1	>1
Groundwater				
Water Table	1×10^{-3}	3×10^{-1}	>1	>1
Intermediate Unit	4×10^{-4}	2×10^{-2}	<1	>1
Upper Sharon Aquifer	8×10^{-8}	NA	<1	NA

NA = not applicable, only one representative sample.

ALTERNATIVE 3 - CAPPING AND OFFSITE DRUM INCINERATION

The major components of this alternative are: excavation and off-site incineration of the contents of buried drums and tanks; construction of a RCRA cap over the site to reduce contact with contaminated materials; construction of a soil-bentonite slurry wall to limit migration of contaminated ground water; lowering of the water table Aquifer by the use of 220 wellpoints; extraction of contaminated groundwater from the Upper Intermediate unit by 12 wellpoints; and access restrictions, monitoring, and resident relocation as described in Alternative 2. This alternative can be implemented within one year at a present worth cost of $15,000,000.

Groundwater extraction and treatment will be the same in subsequent alternatives.

ALTERNATIVE 4 - ONSITE RCRA LANDFILL FOR VADOSE SOIL

This alternative consists primarily of the same components, including off-site incineration of the contents of buried drums and tanks, as contained in Alternative 3, except that contaminated onsite soil within the vadose zone will be excavated and placed into a RCRA landfill constructed on site. As with Alternative 3, site fencing, deed restrictions and monitoring will be necessary since contaminants remain on site. This alternative can be implemented within a two to three year time period at a cost of $22,000,000.

ALTERNATIVE 5 - THERMAL TREATMENT OF "HOT SPOT" SOIL

This alternative consists of similar components as Alternative 3, with the additional excavation and onsite thermal treatment of approximately 32,000 cu. yds. of highly contaminated soil. This alternative had initially included the excavation and treatment of only 27,000 c.y. However, after further review, it was determined that an additional 5,000 c.y. would have to be removed and treated. The rationale for the additional soil volume is based on surface soil blocks exceeding the 1 X 10^{-5} upperbound cancer risk as depicted in Figure 4. The drum and tank contents would be treated on site in the mobile incineration unit. One incineration unit would be employed at the site and the duration of treatment would be approximately 5 years. Treatment residue from the onsite incinerator would be replaced in an onsite RCRA landfill. The time frame for this alternative is five years and has a present worth cost of $25,000,000.

ALTERNATIVE 6 - THERMAL TREATMENT OF VADOSE SOIL

This alternative includes components similar to Alternative 5, except that instead of treating only "hot spot" soil, all vadose soil determined to be contaminated, based on RI soil boring data, would be excavated and incinerated. A total of approximately 105,000 cu. yds. of soil would be excavated, incinerated onsite, and backfilled in the same manner as described in Alternative 5. Two incineration would be employed onsite and the duration of treatment would be approximately nine years. The present worth cost is $46,000,000 for alternative 6.

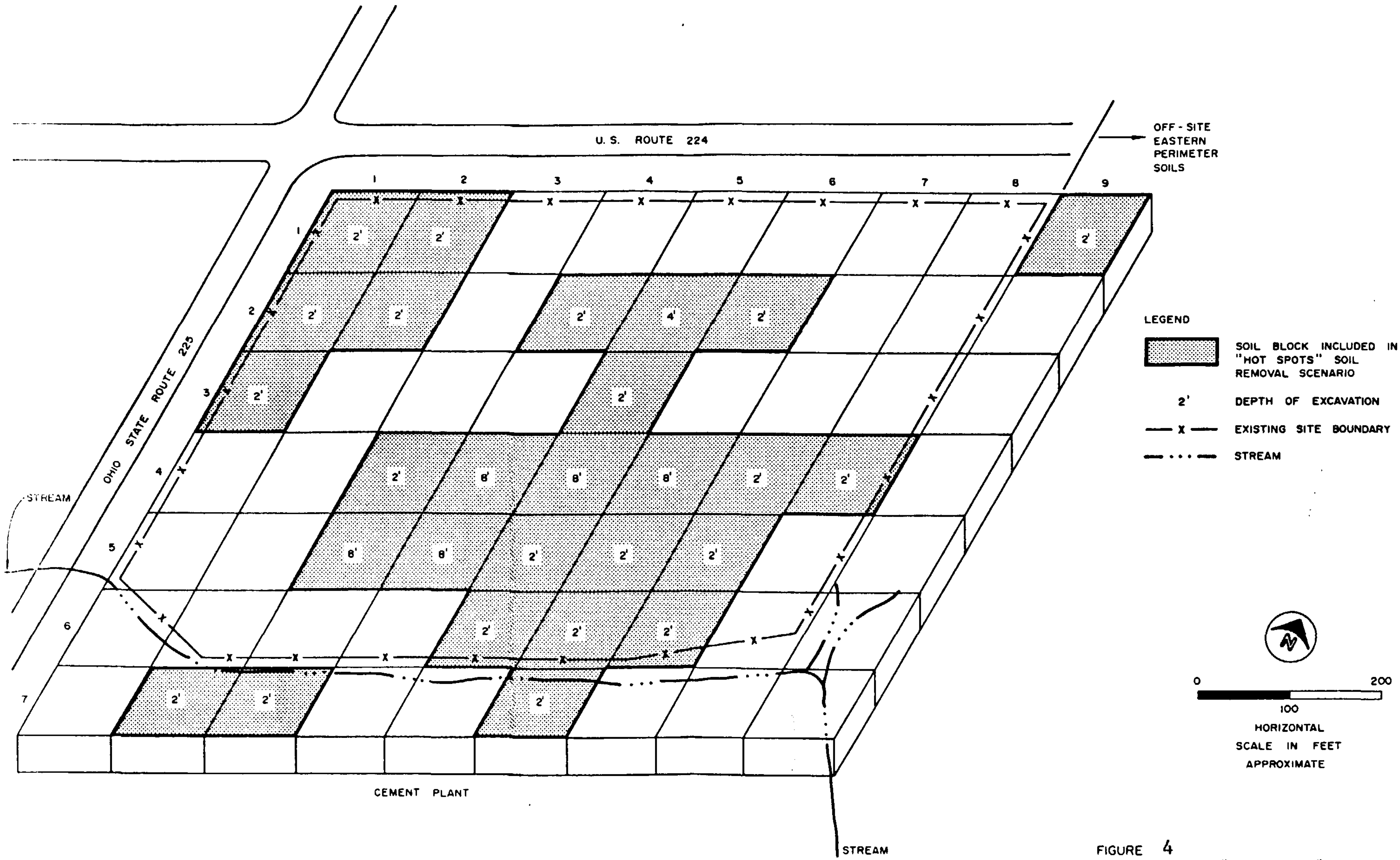

FIGURE 4
DELINEATION OF "HOT SPOTS" SOILS REMOVAL SCENARIO
SUMMIT NATIONAL RESPONSIVENESS SUMMARY

ALTERNATIVE 7 - THERMAL TREATMENT OF ALL UNCONSOLIDATED MATERIAL TO BEDROCK

In this alternative, all contaminated, unconsolidated materials, including buried tanks and drums, all contaminated vadose soil, and all saturated unconsolidated materials associated with the contaminated portion of the water table Aquifer would be excavated and treated on site.

Contaminated soil and other unconsolidated materials amounting to approximately 430,000 cu.yds., would be treated on site using the thermal treatment system described in Alternative 5. Treatment of this material would require an estimated 12 years. The present worth cost is $127,000,000.

ALTERNATIVE 8 - IN SITU VITRIFICATION OF "HOT SPOT" SOILS

This alternative parallels Alternative 5 with the major difference being that in situ vitrification of "hot spot" soils are used as the soil treatment method, rather than onsite incineration. The onsite RCRA landfill would also be eliminated as the soils are vitrified in place. Buried drum and tank contents would be transported off site for thermal treatment. This alternative once in place can be completed within a two year time frame. The present worth cost is $29,000,000.

ALTERNATIVE 9 - IN SITU VITRIFICATION OF VADOSE SOILS

This alternative parallels Alternative 6 with the major difference being that in situ vitrification of the vadose soils is used as the soil treatment method, rather than onsite incineration. The onsite RCRA landfill would also be eliminated as the soils are vitrified in place. Buried drum and tank contents would be transported off site for thermal treatment. Rather than a multi-layer cap, the site will be covered with a simple soil cover at the completion of vitrification. Implementation can be achieved within seven years at a present worth cost of $39,000,000.

GROUNDWATER RESPONSE

The pump and treatment system is incorporated in Alternatives 3 through 9. The vertical barrier and pumping of the contaminated groundwater in both the shallow water table and intermediate unit would lead to restoration of the aquifer. Pumping in the intermediate unit is approximately 2 to 10 years to fully dewater the onsite water table aquifer. However, pumping will be perpetual for gradient control purposes. Cleanup of the intermediate aquifer could occur wuthin 5 to 10 years. These calculations are based on data collected during the RI which indicated a range of hydraulic conductivities values. The extraction system consists in the installation of 220 wells over the site on a 50 ft. grid system.

The treatment process will meet water quality standards and effectively protect human health and the environment. In absence of standards, discharge levels will obtain the best available technology economically achievable criteria. Treated water will be discharged to a surface water point located approximately 3500 feet downgradient of the site. The treatment system will include precipitation, flocculation, coagulation, oil and water separation, filtration, and carbon absorption. It is unlikely that any violations of air emissions of volatile compounds will occur. However, monitoring controls will be taken to assure compliance with air quality standards.

COMPARATIVE ANALYSIS OF ALTERNATIVES

The major objective of the FS for the Summit National site is to evaluate remedial alternatives, that are designed to remediate site contamination and associated problems. The evaluation criteria is consistent with the goals and objectives of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by Superfund Amendments and Reauthorization Act of 1986. The remedial alternative must effectively mitigate and minimize threats to human health, welfare and environment, be implementable, and cost effective.

The nature and extent of site hazards summarized in the Summit RI, form the basis for identifying specific objectives for remediating contaminated soil and subsurface wastes (buried drums and tanks), sediment, surface water, and groundwater and associated free product. The risks identified at the site in the public health risk assessment establish the basis for identifying site-specific goals of remedial measures.

The alternatives were screened based on their ability to protect human health and the environment; achieve State and Federal ARARs (applicable or relevant, and appropriate requirements); reduction in toxicity, mobility, and volume; long and short-term effectiveness; implementability; cost effectiveness; State and community acceptance. Based on screening and detailed analysis of remedial alternatives for the Summit National site, several assembled remedial alternatives, including the no action alternative, were developed.

A summary of the Detailed Analysis of Alternatives is presented in Figure 5. The purpose of the following section is to summarize the relative performance of the alternatives evaluation with respect to the criteria.

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The no action alternative and relocation/monitoring alternatives (1 and 2 respectively), do not provide adequate protection of human health and the environment. The relocation of the Watson resident removes the risk associated with exposure to offsite soils, but does not satisfy the overall protection criteria. Since these two alternatives do not satisfy the protectiveness criteria, they are eliminated from further consideration.

The remaining alternatives provide adequate protection, although they do so through different combinations of treatment, engineering, and institutional controls. All alternatives eliminate the exposure routes to any residual contamination which would result in eliminating any residual risks associated with the site.

Evaluation Criteria	ALTERNATIVE 1 No Action	ALTERNATIVE 2 Monitoring with Resident Relocation	ALTERNATIVE 3 Capping and Offsite Drum Incineration	ALTERNATIVE 4 Onsite RCRA Landfill for Vadose Soil	ALTERNATIVE 5 Thermal Treatment of "Hot Spot" Soil
Protection of Human Health and the Environment	Results in unacceptable health risks which exceed 10^{-6}	Minimal protection by eliminating exposure to current conditions	Adequate protection by treating buried drums and tanks, ground water and surface water. Direct contact with contaminated soils and sediments is eliminated by the multi-layer cap.	Provides additional level of protection than Alternative 3 containing the vadose soil in an onsite RCRA landfill	Adequate protection by treating major sources of contamination, including onsite incineration of "hot spot" soils and containment of residuals
Compliance with ARARs	Does not attain ARARs since site conditions are not altered	Same as Alternative 1	Attains ARARs	Attains ARARs	Attains ARARs
Reduction of toxicity, mobility and volume (TMV)	No reduction in TMV	No reduction in TMV	Achieves reduction in TMV for buried drums and tanks, ground water and surface water. Reduction in mobility for soils is achieved by use of the cap.	Same as Alternative 3 with the additional reduction in mobility by enclosing vadose soils in RCRA landfill	Additional reduction in TMV by incinerating "hot spot" soils
Short-term Effectiveness	Not effective	Most effective since it achieves its response objectives within a short time frame	Same as Alternative 2.	The comprehensive excavation and handling of 105,000 cu. yds. of soil could result in short-term adverse effects	Short-term effects could occur due to excavation and incineration of drums and "hot spot" soils
Long-term Effectiveness	Not effective	Not effective since site conditions are not altered	Provides long-term effectiveness; however, the untreated soils left on site may result in long-term management.	Provides a high degree of long-term effectiveness but requires long-term management	Same as Alternative 4
Implementability	Not applicable	Monitoring and relocation are technically implementable	Implementable, but with transportation and offsite RCRA capacity considerations	Same as Alternative 3, with the added difficulty of handling 105,000 cu. yds. of vadose soils	Implementability considerations are associated with handling and treating "hot spot" soils
Cost[a]	$0	$820,000	$15,000,000	$22,000,000	$25,000,000
State Acceptance[b]	Comments do not address this alternative	Comments do not address this alternative	Comments do not address this alternative	Comments do not address this alternative	Acceptance is uncertain based on comments received
Community Acceptance[c]	Unacceptable by the general community	Same as Alternative 1	No specific comments regarding this alternative	Same as Alternative 3	Acceptable by general community with some concerns regarding emissions resulting from incineration

Evaluation Criteria	ALTERNATIVE 6 Thermal Treatment of Contaminated Vadose Soil	ALTERNATIVE 7 Thermal Treatment of All Unconsolidated Material	ALTERNATIVE 8 In-Situ Vitrification of "Hot Spot" Soils	ALTERNATIVE 9 In-Situ Vitrification of Contaminated Vadose Soils
Protection of Human Health and the Environment	Same as Alternative 5, except additional volume of soils to be treated	Same as Alternative 6, except additional volume of soils to be treated	Adequate protection as in Alternative 3 with the additional treatment of "hot spot" soils by encapsulating contaminants	Same as Alternative 8 except additional volume of soils to be treated
Compliance with ARARs	Attains ARARs	Attains ARARs	Attains ARARs	Attains ARARs
Reduction of toxicity, mobility and volume (TMV)	Additional reduction in TMV over Alternative 5	Additional reduction in TMV over Alternative 6	Same as Alternative 3 except additional reduction in mobility is achieved by encapsulating contaminants	Additional reduction in TMV over Alternative 8
Short-term Effectiveness	Additional short-term adverse effects over Alternative 5 due to a longer time frame of 9 years	Least effective of all in the short-term due to the 12 year time frame	Short-term effects could occur due to the excavation of buried drums and tanks	Same as Alternative 8
Long-term Effectiveness	Same as Alternative 5 except a lesser amount of residuals are left behind on site	Offers the highest degree of long-term effectiveness since it destroys all affected media	Provides long-term effectiveness	Same as Alternative 8
Implementability	Same as Alternative 5 except additional difficulties with handling and treatment a greater amount of soils	Least implementable due to the excessive amount of soils to handle (418,000 cu. yds.)	Implementability considerations are associated with the availability of units and reliability of this innovative technology	Same as Alternative 8
Cost[a]	$46,000,000	$127,000,000	$29,000,000	$39,000,000
State Acceptance[b]	Comments do not address this alternative	Comments do not address this alternative	Comments received but do not indicate a preference	Same as Alternative 8
Community Acceptance[c]	No specific comments regarding this alternative	Same as Alternative 6	No comments regarding this alternative	Same as Alternative 8

Notes:

a Cost estimates are a present worth value based on a 30 year period at 10% interest.

b State acceptance is based on comments received during the RI/FS process and public comment period.

c Community acceptance is based on comments received during the public meeting and public comment period.

Figure 5

SUMMARY OF DETAILED ANALYSIS OF ALTERNATIVES
SUMMIT NATIONAL SITE

COMPLIANCE WITH APPLICABLE AND APPROPRIATE REQUIREMENTS

All protective alternatives are designed to attain the applicable and appropriate requirements of Federal and State environmental laws.

LONG - TERM EFFECTIVENESS AND PERMANENCE

Alternative 7, thermal treatment of all contaminated material down to bedrock, offers the highest degree of long-term effectiveness and permanence since it will destroy virtually all organic contamination present at the site. This alternative is very comprehensive in its scope and is extremely difficult to implement.

Alternatives 6 and 9 afford a high degree of long-term effectiveness and permanence by treating and immobilizing all currently known sources of contamination. While incineration would destroy the organic fraction, the containment of the inorganic fraction would be achieved by the installation of the double synthetic liner. The vitrification alternative, would encapsulate the contamination providing effective immobilization of both organic and inorganic compounds. Alternative 6 is as effective as alternative 9, but due to the liner, alternative 6 may have move intensive long-term management.

Alternatives 5 and 8 are equally effective but are less long-term effective and permanent than alternatives 6, 7, and 9. Alternatives 5 and 8 involve treatment of a lesser amount of contaminated soil, resulting in a greater amount of residual contamination. The remaining untreated soil would be properly contained by the multi-layer cap and any leachability of the soil would be collected by the leachate collection system. Leachate production will be minimal since the watertable will be maintained at a level below the residual contaminated soil. This alternative may require longer-term management than alternative 8.

Alternatives 3 and 4 are identical in the amount of material they leave behind to be managed over time. Alternative 3 provides a multi-layer cap which eliminates direct contact. Alternative 4 would, however, affords a slightly higher degree of long term effectiveness in that residuals would be disposed of in an onsite RCRA landfill. The landfill would include a double synthetic liner which would prevent leaching into groundwater.

REDUCTION OF TOXICITY, MOBILITY, OR VOLUME

Alternatives 5, 6, 7, 8, and 9 would all satisfy the statutory preference for treatment as a principal element. The remedy would address the principal threats at the site under each option.

Alternative 7, would involve thermal treatment of all unconsolidated material and is expected to destroy 100% of all contaminated material, therefore affording the highest degree of reduction in toxicity, mobility, and volume.

Thermal treatment will achieve a destruction and removal efficiency (DRE) of 99.99% for each individual principal organic hazardous constituent (POHC). When dioxins or PCBs are present, the DRE is 99.9999% for each POHC. The degree of overall reduction in TMV correlates to the volume of material that will be treated, which is greatest under alternative 7, and least under alternative 5.

Alternatives 8 and 9 involve in-situ vitrification which encapsulates contaminants thus immobilizing and preventing exposure to their toxicity. The overall reduction in TMV is greater in alternative 9 than under alternative 8.

Alternatives 3 and 4 involve treatment of drum and tank contents, which are equal in reduction of TMV. However, neither alternative addresses the highly contaminated soils so that the principal threats are not fully addressed by treatment.

SHORT - TERM EFFECTIVENESS

Alternatives 2 and 3 are most effective in the short-term in that they can achieve their respective response objectives in less than one year with no potential adverse impacts resulting from implementation activities.

Alternative 8, in-situ vitrification of hot spot soils could be implemented within a two year time frame, which is comparable to alternative 4 construction of a RCRA landfill. There are no anticipated potential adverse effects associated with implementation of vitrification. Alternative 4 requires the excavation and handling of contaminated soils which is technically more comprehensive and could result in short-term adverse effects.

Implementation of alternative 5, thermal treatment of "hot spot" soils is estimated at five years. This alternative could pose potential short-term effects due to excavation, materials handling, and possible air emissions.

Alternative 9, in-situ vitrification of contaminated vadose soils would require a seven year implementation time frame but is not expected to result in adverse impacts on workers, the community, or the environment.

Alternative 6, thermal treatment of vadose soils is estimated at nine years which could pose potential short-term effects. Alternative 7, thermal treatment of all unconsolidated materials, is the least effective of all alternatives in the short-term due to the 12 year time frame. This alternative has the highest potential for adverse impacts on workers, the community, and the environment.

IMPLEMENTABILITY

Alternatives 5 through 9 involve onsite remedial technologies which do not result in off-site complications. Alternatives 5,6, and 7, involve thermal treatment of approximately 32,000, 105,000, and 430,000 c.y. respectively. The implementability considerations associated with the handling and treatment of contaminated soils, construction of an onsite RCRA landfill, and the pumping of the groundwater, presents least implementability problems in alternative 5 and the most difficult in alternative 7.

In-situ vitrification is a less proven technology than thermal treatment. Implementability considerations with this technology for alternatives 8 and 9, include the availability of vitrification units, and the uncertainty over the technical feasibility in the specific waste matrix.

Alternatives 3 and 4 involve off-site thermal treatment of drums and tanks. The transportation and off-site disposal of hazardous materials may present difficulties with the availability of transportation services, and capacity of a RCRA facility. Alternative 4 is more difficult to implement than alternative 3 since it involves the additional handling of soils and construction of an onsite RCRA landfill.

COST

Alternative 7, thermal treatment of all unconsolidated materials, is by far the most costly alternative with a present worth cost estimated at $127,000.000. This compares to $46,000.000 for alternative 6, thermal treatment of the contaminated vadose soils, and $39,000.000 for alternative 9, in-situ vitrification of contaminated vadose soils.

Alternative 4, RCRA landfill of vadose soil; alternative 5 thermal treatment of "hot spot" soils; and alternative 8, in-situ vitrification of "hot spot" soils offer more comparable costs at $22,000.000, $25,000.000, $29,000.000 respectively. Capping with off-site incineration of drums and tanks under alternative 3 would cost $15,000.000.

STATE ACCEPTANCE

The State of Ohio has been consulted throughout the Remedial Investigation and Feasibility Study process. Based on discussions with by the Ohio Environmental Protection Agency plan on the RI/FS and proposed plan, the State concurrs with the selected remedial alternative at the Summit National site.

COMMUNITY ACCEPTANCE

The local community, in general, supports U.S. EPA's preferred alternative based on the comments received during the public comment period. Citizens were concerned with the quality of their drinking water and would like a residential monitoring program to be implemented by the U.S. EPA. Some concern were raised regarding air emissions from the incinerator. These concerns are adequately addressed in the Feasibility Study and will be adressed in the Responsiveness Summary.

TABLE 2

COST ESTIMATE SUMMARY AND TIME TABLE

Alternatives	Capital Cost	Annual O & M	Present Worth 30 yrs at 10%	Estimated Time At Completion
1. No Action	0	0	0	N/A
2. Resident Relocation with Monitoring	$ 150,000	$ 71,000	$ 820,000	< 1 year
3. Capping with offsite Drum and Tank Incineration	$11,000,000	$ 359,000	$ 15,000,000	< 1 year
4. RCRA Landfill for Vadose Soil	$18,000,000	$ 364,000	$ 22,000,000	2 - 3 years
5. Thermal Treatment of "Hot Spot" Soils	$13,000,000	$ 1,132,250	$ 25,000,000	5 years
6. Thermal Treatment of Contaminated Vadose Soils	$21,000,000	$ 4,083,500	$ 46,000,000	9 years
7. Thermal Treatment of All Unconsolidated Materials	$43,000,000	$12,187,000	$127,000,000	12 years
8. In-Situ Vitrification of "Hot Spot" Soils	$15,000,000	$ 5,178,700	$ 29,000,000	2 years
9. In-Situ Vitrification of Contaminated Vadose Soils	$12,000,000	$ 5,646,500	$ 39,000,000	7 years

Pumping is perpetual since its function is gradient control.

SELECTED REMEDY

Based on the evaluation of effectiveness, implementability, protectiveness, reduction of toxicity mobility, and volume, and cost of each proposed alternative, the comments received from the public and the Ohio EPA and the State and Federal environmental requirements, Alternative 5 - Thermal Treatment of "Hot Spot" Soil has been determined to be the most appropriate alternative. However, the selected remedy has been modified to include an additional volume of soil from 27,000 c.y. to 32,000 c.y. (See Alternative 5 on page 12). This results in an additional $1,000,000 for a total of $25,000,000.

This alternative provides adequate protection to public health and environment and significantly reduces the volume, toxicity, and mobility of contaminants. This alternative utilizes treatment technologies, permanent solutions to the maximum extent practicable, and is cost-effective.

A site plan and cross section of Alternative 5 are presented in Figures 6 and 7 respectively. The components of the selected alternative are described as follows:

- Access and Deed Restrictions: A fence will be extended around the site perimeter to assure unauthorized personnel from interfering with ongoing remedial actions and preventing human and animal exposure to site contaminants. Deed restrictions are necessary to control the use of the property once the remedy is in place.

- Elimination of Onsite Surface Water: Surface water in both onsite ponds will be collected by mechical methods and treated prior to discharge. The south and east drainage ditch will be re-routed to an uncontaminated area beyond the site. Sediments excavated from the ditches will be treated along with onsite soils. Surface water in ditches will be treated prior to discharge.

- Excavation and Incineration of Buried Drums, Tanks, "Hot Spot" Soils, and Sediments: A mobile incinerator will be assembled on-site to incinerate approximately 1,600 drums (88,000 gallons of waste), four tanks with volume ranging from 1,000 to 7,500 gallons of waste, 32,000 cubic yards of contaminated soils, including 1,500 cubic yards of contaminated sediments. Performance standards for incinerators of hazardous waste are designated in 40 CFR 264.343. The destruction and removal efficiency (DRE) for each principle organic hazardous constituent (POHC) is 99.99 percent, thereby providing level of assurance that other constituents are also being destroyed. For PCBs and dioxins the DRE is 99.9999% for each POHC. Incineration of waste can be completed within 5 years. Air monitoring will be conducted to assure no air quality standards are violated as a result of the excavation and incineration of soils, sediments, and drums.

- Installation of a Double Synthetic Liner: The incinerated material would be disposed of in an on-site RCRA landfill. This requires the construction of an underlying double synthetic liner. See Figure 8. The liner proposed satisfies EPA/530-SW-85-014, "Minimum Guidance on

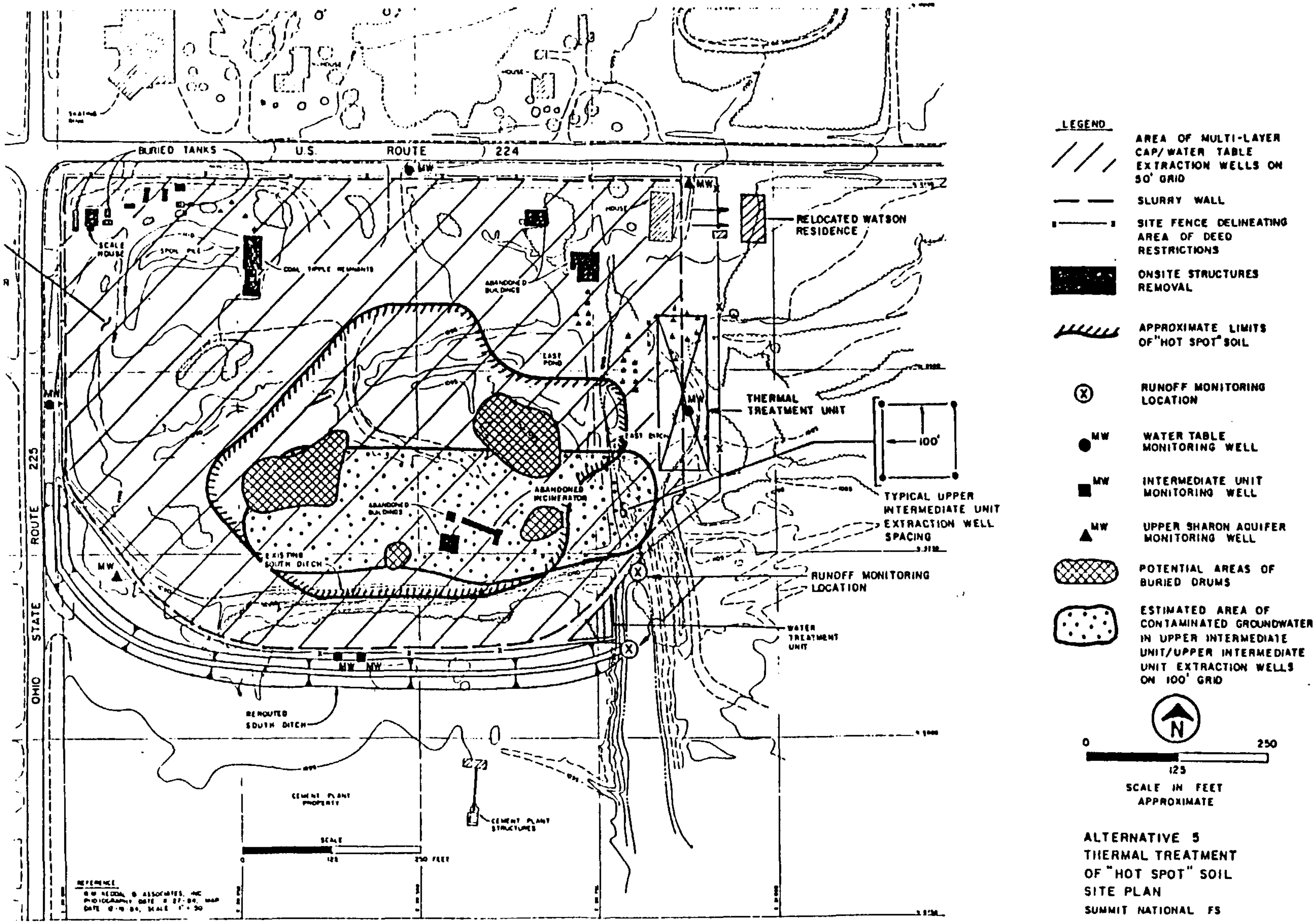
BURIED TANKS
U.S. ROUTE 224
OHIO STATE ROUTE 225
SCALE HOUSE
SPOIL PILE
COAL TIPPLE REMNANTS
ABANDONED BUILDINGS
HOUSE
EAST POND
EAST DITCH
RELOCATED WATSON RESIDENCE
THERMAL TREATMENT UNIT
100'
TYPICAL UPPER INTERMEDIATE UNIT EXTRACTION WELL SPACING
ABANDONED INCINERATOR
EXISTING SOUTH DITCH
RUNOFF MONITORING LOCATION
WATER TREATMENT UNIT
REROUTED SOUTH DITCH
CEMENT PLANT PROPERTY
CEMENT PLANT STRUCTURES
MW
LEGEND
AREA OF MULTI-LAYER CAP/WATER TABLE EXTRACTION WELLS ON 50' GRID
SLURRY WALL
SITE FENCE DELINEATING AREA OF DEED RESTRICTIONS
ONSITE STRUCTURES REMOVAL
APPROXIMATE LIMITS OF "HOT SPOT" SOIL
RUNOFF MONITORING LOCATION
WATER TABLE MONITORING WELL
INTERMEDIATE UNIT MONITORING WELL
UPPER SHARON AQUIFER MONITORING WELL
POTENTIAL AREAS OF BURIED DRUMS
ESTIMATED AREA OF CONTAMINATED GROUNDWATER IN UPPER INTERMEDIATE UNIT/UPPER INTERMEDIATE UNIT EXTRACTION WELLS ON 100' GRID
N
0
125
250
SCALE IN FEET APPROXIMATE
ALTERNATIVE 5
THERMAL TREATMENT
OF "HOT SPOT" SOIL
SITE PLAN
SUMMIT NATIONAL FS

FIGURE 6

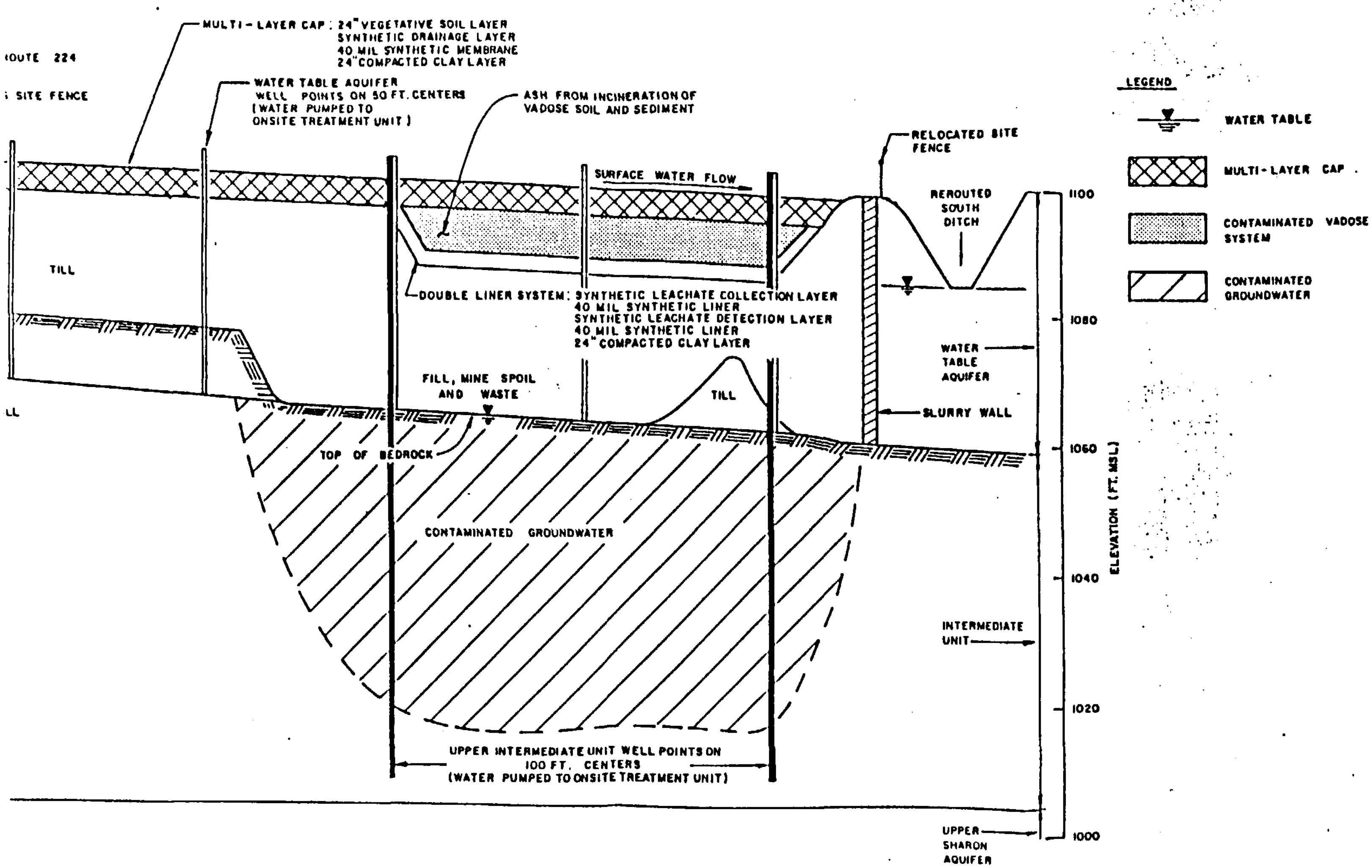

FIGURE 7

ALTERNATIVE 5 - THERMAL TREATMENT OF "HOT SPOT" SOIL
GENERALIZED NORTH - SOUTH CROSS SECTION
SUMMIT NATIONAL FS

Double Liner Systems for Landfills and Surface Impoundments, Design, Construction and Operation." Groundwater and Leachate monitoring will be required to evaluate the performance of the landfill.

- Removal of Onsite Structures: All onsite structures would be demolished or dismantled and disposed of onsite. Structures placed into an on-site RCRA landfill do not require decontamination as designated in 40 CFR 264.114.

- Installation of a Vertical Barrier: A soil-bentonite slurry wall approximately three feet thick would be constructed around the perimeter of the site to a depth of approximately 40 feet. This depth would include six feet of penetration into the bedrock to assure a good seal. The permeability of the slurry wall will achieve approximately 10^{-7} cm/sec. The slurry wall will prevent lateral migration offsite of groundwater and free product.

- Installation of Groundwater Extraction System: A network of 220 wells installed on a 50 ft. grid system over the site, and a pumping rate of 30 gpm was assumed. These figures will have to be refined by performing in-field pumping tests for final design. Twelve of the 220 wells will extract groundwater from the intermediate units. The extracted water will be treated onsite.

- Groundwater Pump and Treat System: The remediation for groundwater includes dewatering of the watertable aquifer and stagnating contaminant migration in the intermediate units. Clean-up of the intermediate unit can occur within 5 to 10 years. The groundwater pumping will be perpetual for gradient control purposes. The treatment will consist of physical treatment including precipitation, flocculation, coagulation, oil and water separation, filtration, and carbon adsorption. The effluent levels will attain Federal and/or State water quality standards. In absence of standards, discharge levels will attain the best available technology economically achievable criteria. It is unlikely that air emissions from the treated water will result, however the appropriate monitoring controls will be taken. The discharge point will be downgradient approximately 3500 feet southeast of the site.

- Installation of a Multi-layer Cap: A multi-layer cap would be installed over the site to prevent contact with surface soils and greatly reduce the volume of water infiltration through the unsaturated zone. Prior to placing the cap the site would be regraded to provide site drainage and prevent water from ponding on site. The layer would consist of one foot of top soil (loam), one foot of earth clean fill, filter fabric, high density polyethylene (HDPE) drainage net, and a two foot compacted clay layer. The multi-layer cap is in accordance with performance standards listed in 40 CFR 264.310. A RCRA cover design is site specific and the ultimate design will be determined during the remedial design phase. The diagram provided in Figure 9 is in accordance with RCRA guidelines.

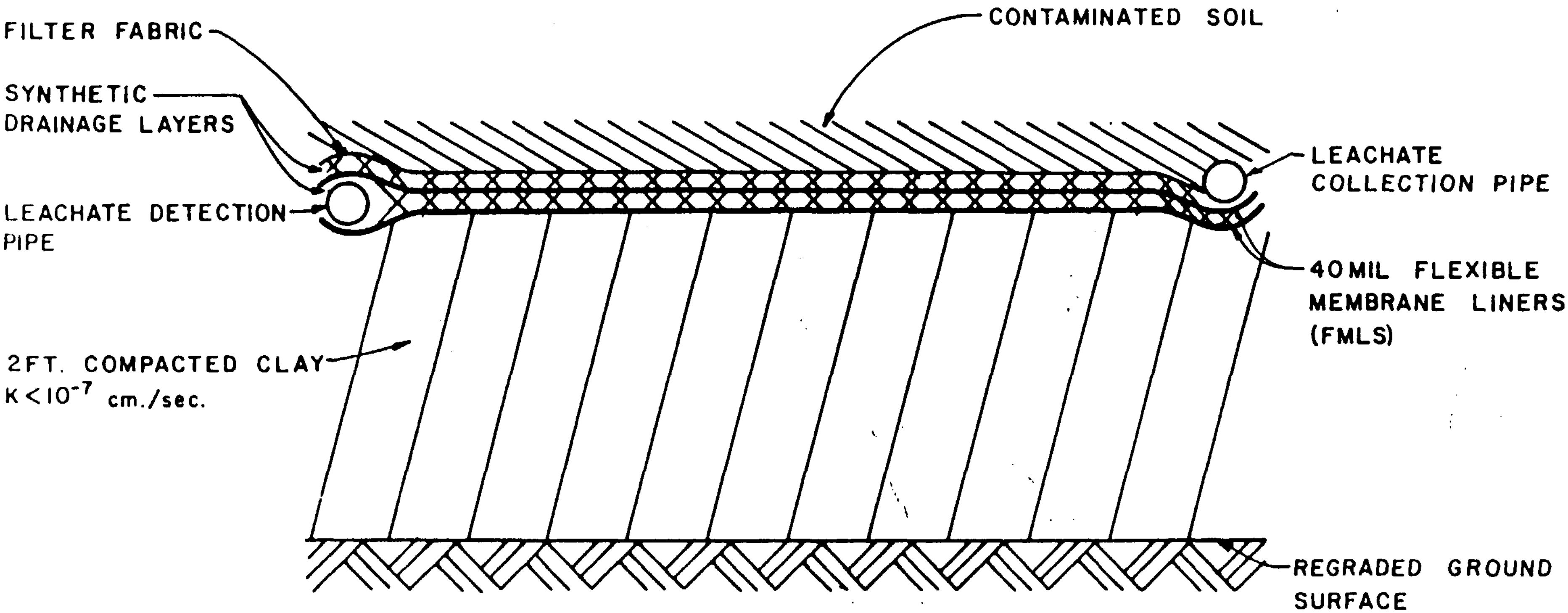

FIGURE 8
TYPICAL RCRA LANDFILL LINER
SUMMIT NATIONAL FS

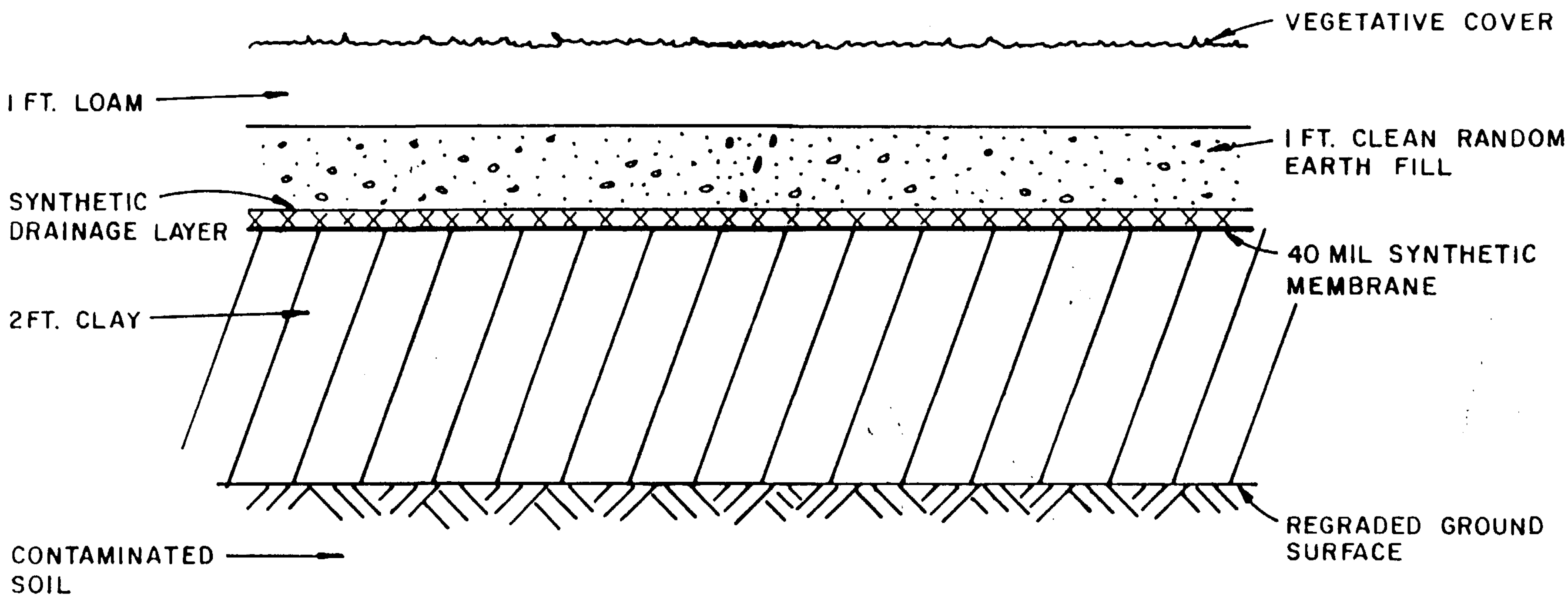

FIGURE 9
MULTI-LAYER CAP
SUMMIT NATIONAL FS

- Runoff Monitoring: Surface water and sediment samples will be collected and analyzed on a quarterly basis from the southeast discharge point. Monitoring will detect any migration of site contamination originating in soils and sediments. Monitoring will be an ongoing activity.

- Groundwater Monitoring: Groundwater in the watertable, intermediate, and Upper Sharon aquifer, will be monitored to detect any contaminant migration. Samples will be taken and analyzed on a quarterly basis at seven monitoring location points. Monitoring will be an ongoing activity for a minimum of 30 years.

- Relocation of the Watson Residence and Cement Plant Property: The installation of the slurry wall, multi layer cap, and rerouting of the southern and eastern drainage ditch, could not be completed due to the location of the Watson's and cement plant property. Additionally, there is a risk associated with soils that exceed 10^{-6} that also warrants remediation. Therefore, relocation of the Watson's residence and acquisition of the cement plant property are necessary to accomplish remediation at the site. The proper steps are being undertaken with the affected parties and appropriate agencies.

The 30 years present worth value for the selected alternative at a discount rate of 10 percent, is $25,000,000. The breakdown of the estimated cost is presented in Table 3.

STATUTORY DETERMINATIONS

Protection of Human Health and the Environment

The risks associated with direct contact with, or ingestion of surface and subsurface soils, and sediments will be eliminated by the installation of the multi-layer cap. Additionally, the contaminated soils referred to as "hot spots" will be treated and contained in an onsite RCRA landfill, which potentially eliminates migration into groundwater. Any leachate generated would be extracted and treated onsite.

Onsite incineration may result in short-term low level emissions of organics in the soil feed, and products of incomplete combustion. There will be an air emissions control system on the incineration to decrease particulate matter to the permitted levels. Thus, risks associated with inhalation will be controlled.

The components contributing to protection from groundwater associated risks include the installation of vertical barriers, groundwater extraction wells followed by treatment. The barrier reduces contaminated groundwater from migrating off-site, and in combination with the extraction system, it reduces the rate of downward contaminant movement. This remediation along with treatment decreases the long-term health risks associated with groundwater.

Elimination of surface water will eliminate intermittent exposure to surface water through ingestion or absorption. The surface water will be treated in the same manner as groundwater. Thus, risks associated with surface water will be eliminated.

The excavation of buried drums and tanks, and the demolition of on-site structures, may lead to short-term increases in fugitive dust and possible volatile organics which may lead into short-term health risks. Dust control measures would be employed during this task, thus mitigating the potential for health risks from exposure to dust.

The technologies under this alternative achieve adequate protection of human health and the environment. Access and deed restrictions, and institutional controls will ensure that no future action will interfere with the components of the remedial alternative, thus, assuring long-term protectiveness.

Attainment of Applicable or Relevant and Appropriate Requirements

The selected alternative is designed to meet Federal and State requirements that are applicable or relevant and appropriate. The requirements for the selected alternative, thermal treatment of "hot spot" soils, are presented in Table 4.

COST EFFECTIVENESS

The selected remedy represents the best balance across the evaluation criteria. It is U.S. EPA's policy to select a remedy which significantly reduces toxicity, mobility, and volume of hazardous constituents and minimizes long-term management.

The selected remedy for the Summit National site includes general site preparation, incineration, excavation and loading of contaminated material, a double liner system, a multi-layer cap, groundwater extraction and treatment system, and monitoring at a present worth cost of $25,000,000. The variable factors that significantly effect the relative cost differences between alternatives are in-situ treatment, the installation of the double liner system, and the volume of soils to be treated and handled.

Thermal treatment is a proven technology which can effectively destroy organic contamination at a reasonable cost. The amount of soils defined as "hot spot" soils equivalent to 32,000 c.y., is based on historical data, chemical concentrations, and estimated health risks and residual risks. The delineation of "hot spot" soils provides an increased level of protection reducing the upperbound lifetime cancer risk associated with the site from $2x10^{-4}$ to $2x10^{-5}$. This removal scenario represents the best balance between protectiveness, technical feasibility, and cost-effectiveness.

The costs associated with the double liner system are directly related to the volume of soils to be treated. The double liner system is a requirement and provides an increased level of protection by containing inorganic residuals in the treated soils. A detailed cost summary for the selected alternative is presented in Table 3.

exposure and is equal to 10^{-6} for the average exposure scenario. The future residential scenario for exposure to on-site soils results in average risks of 1×10^{-5} and plausible maximum risk of 5×10^{-3}. Both values are at least one order of magnitude higher for on-site soils than background soils.

B. Feasibility Study:

Comments (i):

The PRPs believe that the extension of the site boundary is unnecessary.

U.S. EPA's Response (i):

The extension of the site boundary is not based solely on soil contamination, but also concerns regarding the off-site extent of groundwater contamination and contaminated off-site sediments. The slurry wall and the relocating of the southern drainage ditch must be constructed beyond the area of contamination. In conclusion, adjacent offsite properties are required for implementation of the remedial action.

Comments (ii):

The PRPs propose that a permeable soil cover should be installed instead of a RCRA cap.

U.S. EPA's Response (ii):

There are no available data to indicate that flushing of the contaminated subsurface soils would lead to their cleanup. Infiltration through the permeable soil cover proposed by the commenters would be counter-productive to the groundwater extraction and gradient control system as outlined in the recommended alternative. In addition, the soil cover does not properly contain hazardous materials from becoming exposed due to freeze and thaw cycles which can cause cracking.

Comment (iii):

The PRPs believe that the FS has erred in its evaluation by considering subsurface soils to be available for human contact and incidental ingestion.

U.S. EPA's Response (iii):

The risk numbers estimated for subsurface soil blocks were used as a mechanism to select soil blocks to be included in the "hot spot" soil removal scenario, and not to define the risk of the site. The risk associated with soils was based on surface soil blocks units. The risks estimated for soil blocks at 2 ft. depth intervals from 2-8 ft.

TABLE 3

Cost Estimate Summary
Alternative 5
Incineration of Hotspot Soil

Item	Capital Cost	Annual O & M	Present Worth 30 Years O&M/Replacement 3%	5%	10%
I. GENERAL SITE PREPARATION					
Decontamination Facility	$14,000	$4,500	$24,000	$23,000	$20,000 *
Move Watson Residence	$21,000				
Extend Site Boundary	$20,000				
Extend Site Fence	$20,000	$1,000	$20,000	$15,000	$9,400
Reroute S. Drainage Ditch	$75,000				
Diversion Berm	$30,000	$5,000	$27,000	$25,000	$22,000 *
Demolition of Site Structures	$54,000				
Buildings for Incinerator	$120,000				
Soil Storage Building	$44,000				
II. INCINERATION					
Capital	$1,300,000				
Maintenance		$50,000	$270,000	$250,000	$220,000 *
Operation		$1,800,000	$9,800,000	$9,100,000	$7,800,000 *
III. EXCAVATION & LOADING OF CONTAMINATED MATERIAL					
Drum Excavation/Classification	$580,000				
Soil Excavation	$180,000				
Soil Handling and Loading	$200,000				
Backfill Ash and Compact	$170,000				
IV. DOUBLE LINER SYSTEM					
Clay Layer	$170,000				
Drainage System	$67,000				
HDPE Liner	$130,000	$3,000	$59,000	$46,000	$28,000
Geotextile	$46,000				
V. MULTI-LAYER CAP					
Clay Layer	$670,000				
HDPE Liner	$310,000	$5,000	$98,000	$77,000	$47,000
Drainage Layer	$220,000				
Vegetative Soil Layer	$580,000		$250,000	$180,000	$86,000 **
Revegetation	$20,000	$1,000	$55,000	$40,000	$21,000 **
VI. GROUNDWATER					
Slurry Wall	$690,000				
Wells in Water Table Aquifer	$1,200,000	$180,000	$3,500,000	$2,800,000	$1,700,000
Oil Skimmers	$90,000				
Wells in Upper Intermediate Unit	$82,000	$15,000	$290,000	$230,000	$140,000
5 Year Pump Replacement			$810,000	$610,000	$340,000
VII. WATER TREATMENT					
Total System 50 GPM	$250,000	$87,000	$1,700,000	$1,300,000	$820,000
VIII. MONITORING					
Onsite Laboratory	$400,000	$110,000	$600,000	$560,000	$480,000 *
Runoff Monitoring		$16,000	$310,000	$250,000	$150,000
Groundwater Monitoring	$32,000	$54,000	$1,100,000	$830,000	$510,000
CONSTRUCTION SUBTOTAL	$7,800,000		$19,000,000	$16,000,000	$12,000,000
Health and Safety (10%)	$780,000				
Bid Contigency (15%)	$1,200,000				
Scope Contingency (20%)	$1,600,000				
CONSTRUCTION TOTAL	$11,000,000				
Permitting & Legal (5%)	$550,000				
Services During Construction (8%)	$900,000				
TOTAL IMPLEMENTATION COST	$12,000,000				
Engineering & Design (10%)	$1,100,000 ***				
TOTAL CAPITAL COSTS	$13,000,000				
PRESENT WORTH			$32,000,000	$29,000,000	$25,000,000

* Present worth calculated over 5 yr. treatment period.
** Present worth calculated assuming replacement of 30% topsoil, regrading, and revegetating every 10 yrs.
*** Engineering and design costs do not include pre-engineered incineration unit.

TABLE 4

Compliance with Applicable or Relevant and Appropriate Requirements for the Selected Alternative at the Summit National Site

Requirement	Source of Regulation	Applicability or Relevance and Appropriateness
FEDERAL		
Resource Conservation and Recovery Act (RCRA)	RCRA Subtitle C, 40 CFR 260	RCRA regulates the generation, transport, storage, treatment, and disposal of hazardous waste. CERCLA specifically requires (in Section 104(c)(3)(B)) that hazardous substances from removal actions be disposed of at facilities in compliance with Subtitle C of RCRA.
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	RCRA Section 3004, 40 CFR 264 and 265	Regulates the construction, design, monitoring, operation, and closure of hazardous waste facilities. Subparts N and O specify technical requirements for landfills and incinerators, respectively.
Standards Applicable to Transporters of Hazardous Waste	RCRA Section 3003, 40 CFR 262 and 263, 40 CFR 170 to 179	Establishes the responsibility of offsite transporters of hazardous waste in the handling, transportation, and management of the waste. Requires a manifest, recordkeeping, and immediate action in the event of a discharge of hazardous waste.
EPA Administered Permit Programs: The Hazardous Waste Permit Program	RCRA Section 3005, 40 CFR 270, 124	Covers the basic permitting, application, monitoring and reporting requirements for offsite hazardous waste management facilities.
EPA Interim Policy for Planning and Implementing CERCLA Offsite Response Actions	50 FR 45933 November 5, 1985	Discusses the need to consider treatment, recycling, and reuse before offsite land disposal is used. Prohibits use of a RCRA facility for offsite management of Superfund hazardous substances if it has significant RCRA violations.
Hazardous and Solid Waste Amendments of 1984 (1984 Amendments to RCRA)	PL 98-616, Federal Law 71:3101	Specific wastes are prohibited from land disposal under the 1984 RCRA Amendments. This includes a ban on the placement of wastes containing free liquids. Also, solvent-containing wastes are prohibited from land disposal, effective November 1986. EPA is also required to set treatment levels or methods, exempting treated hazardous wastes from the land disposal ban. To date, these treatment standards have not been promulgated. The RCRA amendments will also restrict the landfilling of most RCRA-listed wastes by 1991 unless treatment standards are specified.
Clean Air Act (CAA)	40 CFR 1 to 99	Applies to major stationary sources, such as treatment units, that have the potential to emit significant amounts of pollutants such as NO_x, SO_2, CO, lead, mercury and particulates (more than 250 tons/year). Regulations under CAA do not specifically regulate emissions from hazardous waste incinerators, but it is likely that Prevention of Significant Deterioration (PSD) provisions would apply to an onsite thermal treatment facility.
National Environmental Policy Act (NEPA)	NEPA Section 102(2)(c)	CERCLA actions are exempted from the NEPA requirements to prepare an environmental impact statement (EIS) because U.S.EPA's decisionmaking processes in selecting a remedial action alternative are the functional equivalent of the NEPA analysis.
Intergovernmental Review of Federal Program	Executive Order 12372 and 40 CFR 29 (Replaces state and area-wide coordination process required by OMB Circular A-95)	Requires state and local coordination and review of proposed EPA assisted projects. The EPA Administrator is required to communicate with state and local officials to explain the project, consult with other affected federal agencies, and provide a comment period for state review.
Toxic Substance Control Act (TSCA)	40 CFR 761.60(a)(4)	Requires that materials disturbed or excavated which contain 50 ppm or greater PCBs be disposed at a landfill authorized under 40 CFR 761.75 or an incinerator authorized under 40 CFR 761.70.

TABLE 4
(con't)

Compliance with Applicable or Relevant and Appropriate Requirements for the Selected Alternative at the Summit National Site

Requirement	Source of Regulation	Applicability or Relevance and Appropriateness
National Pollutant Discharge Elimination System (NPDES) Permit	Clean Water Act Section 402, 40 CFR 122, 123, 125 Subchapter N	Regulates the discharge of water into public surface waters.
Toxic Pollutant Effluent Standards	40 CFR 129	Regulates the discharge of the following pollutants: aldrin/dieldrin, DDT, endrin, toxaohene, benzidine, and PCB's.
Conservation of Wildlife Resources	Fish and Wildlife Coordination Act	This act requires agency consultation prior to modifying any body of water.
Occupational Safety and Health Act (OSHA)	29 CFR 1910	Regulates working conditions to assure safety and health of workers.
Relocation Assistance and Property Acquisition	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1979, 40 CFR 4	Requires that property owners be compensated for property acquired by the federal government.
* Interim RCRA/CERCLA Guidance on Non-Contiguous Sites and Onsite Management of Waste and Treated Residue	U.S. EPA Policy Statement March 27, 1986	If a treatment or storage unit is to be constructed for onsite remedial action, there should be clear intent to dismantle, remove, or close the unit after the CERCLA action is completed. Should there be plans to accept commercial waste at the facility after the CERCLA waste has been processed, it is EPA policy that a RCRA permit be obtained before the unit is constructed.
* U.S.EPA Groundwater Protection Strategy	U.S.EPA Policy Statement August 1984	Identifies groundwater quality to be achieved during remedial actions based on the aquifer characteristics and use.
STATE AND LOCAL		
** State Hazardous Waste Site Permit	Ohio Solid and Hazardous Waste Disposal Law and Ohio Hazardous Waste Management Regulations. Ohio Revised Code: 3734-01 through 99 and Ohio Administrative Code 3745-50 through 69.	If a new hazardous waste facility must be created to handle the wastes for longer than 90 days, state approval and/or generator I.D. may be required as a precondition.
** Local Operating Permit or License for Remedy	Zoning, building or fire code, or local licensing laws.	Obtain local permit or license approving operation of site facilities.
** State Hazardous Waste Manifest and State Permit or License for Transport of Hazardous Waste	Ohio hazardous waste management, hazardous materials transport, or commercial driver licensing regulations. Ohio Administrative Code 3745-52, 53	In general, the manifest systems require the generator to obtain a permit to transport wastes on public rights-of-way within the state, to use only licensed transporters, and to designate only a permitted TSD facility to take delivery of wastes.

* These are not ARARS, however they will be applied as necessary.

** Permits are not required but nonetheless the conditions will be met.

TABLE 4
(con't)

Compliance with Applicable or Relevant and Appropriate Requirements for the Selected Alternative at the Summit National Site

Requirement	Source of Regulation	Applicability or Relevance and Appropriateness
** Local Approval of Grading (Erosion Control) Permit (Ohio has requirements for erosion control)	Local grading ordinances or erosion control ordinances.	Requirements affecting land slope and cover, surface water management, alteration of natural contours, or cover by excavation or fill.
** Local Approval of Use Permit	Local Building Code	Demonstration through presentation of evidence or onsite inspection that remedial action complies with the requirements of local health and safety laws and ordinances.
** Local Building Permits (includes electrical, plumbing and HVAC)	Local Building Codes	Obtain permits for construction.
** Ohio NPDES Permit	Ohio Water Pollution Control. Ohio Administrative Code 3745-33, 40 CFR 123.	Regulates all point source discharges to surface waters of the state.
** State Solid Waste Site Permit	Ohio Solid Waste and Licensing Requirements. Ohio Administrative Code 3745-27 and 37.	Regulations solid waste treatment, storage and disposal activities.
Ohio Water Quality Standards	Ohio Administrative Code 3745-1	Establishes minimum water quality criteria requirements for all surface waters of the state.

** Permits are not required but nonetheless the conditions will be met.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

All alternatives were carefully evaluated according to the evaluation criteria. After balancing the outcomes of the various alternatives, the selected remedy is the most appropriate solution for the Summit National site. This selected remedy provides permanent protection of human health and the environment from risks associated with soils, sediments, surface water and groundwater. Protection is achieved by utilizing alternative treatment system that destroys contaminants to non-hazardous levels. The long-term effectiveness is achieved within a 5 year time frame without causing potential risks. This remedy can be readily implemented at a reasonable cost and represents the practicable extent to which permanent solutions and treatment technologies can be utilized at the site.

Preference for Treatment as a Principal Element

The selected remedy addresses the principal threats posed by the site through the use of treatment technologies, thus satisfying the statutory preference for remedies that employ treatment as a principal element.

OPERATION AND MAINTENANCE

Several operation and maintenance (O&M) costs are associated with post closure activities after completion of the remedial action. The O&M costs were estimated on an annual basis over 30 years. The O&M for the selected alternative will require ongoing maintenance and monitoring of the onsite landfill and cap construction, groundwater extraction system, water treatment system (up to 12 years), runoff and groundwater monitoring. The O&M costs are presented in Table 3.

STATE AGREEMENTS

A financial agreement with the State of Ohio would be needed in the event negotiations with the potential responsible parties are unsuccessful. Section 104(c)(3) of CERCLA sets forth the State's financial responsibilities in remedial actions provided under CERCLA. The State financial responsibilities in the proposed remedial action would include payment or assurance of payment of 10% of the costs of remedial action, and assurance of all future O&M costs after the initial 1 year period of the remedial action. With respect to O&M costs for ground and surface water restoration, the State financial responsibilities would be incurred after an initial 10 year period.

The capital costs of the remedial action will be covered under a State Superfund Contract between the State and the U.S. EPA at the completion of design of the Remedial Alternative. The annual operation and future O&M costs will be covered under a Cooperative Agreement between the State and the U.S. EPA at the completion of design of the Remedial Alternative.

FUTURE ACTIONS

The need for any future actions for the Summit National site will be explored during pre-design. Pre-burn tests will be required to demonstrate the various type of thermal treatment processes that are applicable for the particular waste at the Summit National site. Pumping tests will be done to refine the exact location and numbers of extraction wells to enhance pumping of the watertable and intermediate aquifers. These pre-design actions and additional information will be used during the design, and cost estimates will be revised to reflect a more accurate cost for the project.

SCHEDULE

The following is a preliminary schedule estimated for implementation of the selected remedial alternative. This is a tentative schedule and is subject to change pending negotiations with the responsible parties, and unforeseen obstacles related to design and construction.

Approval of Remedial Action (Sign ROD)	June, 1988
Estimated Design Period	15 months
Complete Design	August, 1989
Advertise for Competitive Bids	September, 1989
Open Bids	October, 1989
Contract Award	November, 1989
Notice to Proceed	December, 1989
Estimated Construction Period	5 years
Construction Complete	December, 1994